## REMARKS

The Applicants respectfully request reconsideration in view of the following remarks and amendments. No claims are amended. Accordingly, claims 1-15 are pending in the application.

### I.     Objections to the Specification

The Examiner has objected to the amendment filed on June 7, 2007, under 35 U.S.C. § 132(a) because it introduces new matter into the disclosure. In particular, the Examiner objected to the portion of the Specification related to the Technical Field section because the methods were not supported by the Specification as originally filed. In response, the Applicants have amended the portion of the Specification related to the Technical Field section and the title of the application to reflect how they were disclosed in the Specification as originally filed.

Further, the Examiner objected to page 11, lines 24-32, because it is unclear what the "AudioFX node" is describing. The Applicants submit that the "Audio FX node" is clearly described in the 4th page, lines 3-5 of the Specification as follows: "In the MPEG-4 Audio Binary Format for Scene (Audio BIFS), an AudioFX node and a DirectiveSound node are used to express spatiality of a three-dimensional audio scene." Moreover, the AudioFX node is included in the MPEP-4 specification (as part of Audio BIFS) for producing audio effects.

Lastly, the Examiner objected to the Specification because it fails to indicate that Fig. 2 is a diagram depicting a scene of Audio BIFS. In response, the Applicants have amended this portion of Specification to reflect what was disclosed in the Specification as originally filed. In particular, this portion of the Specification now recites, "FIG. 2 is a diagram describing a method for expressing spatial sound source by grouping successive point sound sources."

Thus, in view of the foregoing amendments, the Applicants believe that the Specification is compliant under 35 U.S.C. § 132(a). Accordingly, the Applicants respectfully request reconsideration and withdrawal of the objection to the Specification.

## II.  Claims Rejected Under 35 U.S.C. § 102

Claims 1-15 are rejected under 35 U.S.C. 102(b) as being anticipated by Padula (US006330486B1) (hereinafter "Padula"). To establish an anticipation rejection the Examiner must show that the cited reference teaches each element of a claim.

With respect to claim 1, this claim recites the elements of "the sound source characteristics information includes spatiality extension information of the sound source, said spatiality extension information enabling the sound source to include more than one dimension, and includes the size and shape of the sound source expressed in a three-dimensional space." The Applicants submit that Padula fails to teach these elements as explained in the following discussion.

Padula mentions that the user's field of view and the virtual camera field of view will often be unequal. See Padula, col. 2, lines 38-42. When this occurs, the visually perceived location of an audio source may be distorted by differences between the respective fields of view. See Padula, col. 2, lines 42-45. Padula states that it is, therefore, necessary to correct distortions introduced by the disparity between the virtual camera field of view and a user's field of view by identifying the appropriate "location" of an audio source in accordance with a user's visual perception of the virtual environment. See Padula col. 2, lines 41-45; col. 3, lines 9-16.

Padula, however, does not disclose a method for generating or consuming a three-dimensional audio scene. Padula discloses a method for <u>obtaining a visually consistent acoustic perspective that compensates for distortions in apparent audio source "location."</u> See Padula, col. 3, lines 28-33. In other words, Padula discloses a method for <u>correcting discrepancies</u> in the apparent location of audio sources in a computer representation of a three-dimensional environment. Moreover, the method of Padula <u>compensates for distortions created by disparities between the virtual camera field of view and the observer's field of view</u>. See Padula, Abstract.

With respect to claim 1, the Examiner stated (see page 3 of the Office Action) that the effect of the sound source spreads to other locations because the sound source is movable. However, as discussed above, <u>the sound source of Padula is positioned just for compensating for distortions</u> in an apparent audio source "location," so the effect of the sound source is not spread

to other locations. The spatiality of the sound source of <u>Padula</u> is therefore not extended as required by claim 1.

Further, the Examiner also stated (see page 3 of the Office Action) that the sound source of <u>Padula</u> is not a single dot in the audio scene, and includes more than one dimension because the sound source of <u>Padula</u> has size and shape. However, as shown in Fig. 4, <u>Padula only mentions compensation for distortions of the "location" of the sound source</u> that are created by disparities between the virtual camera field of view and the observer's field of view. <u>Padula</u> obtains the object location at the processing block 71 and determines the warped azimuth and elevation at the processing block 75. See <u>Padula</u>, col. 7, line 56; col. 9, lines 36-42. The consideration of the "location" of the sound source in <u>Padula</u> means <u>Padula</u> does not disclose the sound source having size and shape as required by claim 1. For example, even assuming that the Examiner's allegation is correct, <u>if the sound source of Padula had size and shape, Padula should have mentioned compensation for distortions of the size and shape of the sound source because there naturally would be distortions of the size and shape of the sound source created by the disparities between the virtual camera field of view and the observer's field of view</u>. <u>Padula</u>, in contrast, states that "[t]he object definitions typically include the characteristics of the objects in the virtual world, including the shape, size and location of the defined objects. ... [and] [o]ne example of a defined object in a virtual world is a Sound node in VRML. Moreover, the location of an object is typically defined by its coordinates in a right-handed, three-dimensional Cartesian coordinate system." See <u>Padula</u>, col. 3, lines 46-53. In other words, the object definition including the shape and size is for <u>a visual object</u>. On the other hand, a sound source can be defined only by the Sound node in VRML and thus there is no way of specifying the characteristics of a sound source with shape and size as required by claim 1.

With respect to the Sound node in VRML disclosed in <u>Padula</u> as discussed above, ISO/IEC 14772-1:1997, the Virtual Reality Modeling Language (VRML), also referred to as "VRML97," defines the Sound node for specifying the characteristics of a sound source and treats the <u>sound source as a point source</u>, as follows (see ISO/IEC 14772-1:1997, p. 113):

> The Sound node specifies the spatial presentation of a sound in a VRML scene. <u>The sound is located at a point</u> in the local coordinate system and emits sound in an elliptical pattern (defined by two ellipsoids). The ellipsoids are oriented in a direction specified by

the *direction* field. The shape of the ellipsoids may be modified to provide more or less directional focus from the location of the sound.

In addition, ISO/IEC 14772-1:1997 shows the attributes of the Sound node representing the sound source by the location, direction, and intensity, as follows (see ISO/IEC 14772-1:1997, p. 113):

```
Sound {
    exposedField  SFVec3f  direction   0 0 1    #  (-∞,∞)
    exposedField  SFFloat  intensity   1        #  [0,1]
    exposedField  SFVec3f  location    0 0 0    #  (-∞,∞)
    exposedField  SFFloat  maxBack     10       #  [0,∞)
    exposedField  SFFloat  maxFront    10       #  [0,∞)
    exposedField  SFFloat  minBack     1        #  [0,∞)
    exposedField  SFFloat  minFront    1        #  [0,∞)
    exposedField  SFFloat  priority    0        #  [0,1]
    exposedField  SFNode   source      NULL
    field         SFBool   spatialize  TRUE
}
```

The *spatialize* field specifies if the sound is perceived as being directionally located relative to the viewer. If the *spatialize* field is **TRUE** and the viewer is located between the transformed inner and outer ellipsoids, the viewer's direction and the relative location of the Sound node should be taken into account during playback. If the *spatialize* field is FALSE, then directional effects are ignored (see ISO/IEC 14772-1:1997, p. 115). Therefore, in light of the foregoing, size and shape of the sound source expressed in a three-dimensional space is not part of the Sound node in VRML of Padula because ISO/IEC 14772-1:1997 discloses that the sound source is a point.

In the Response to Arguments section, the Examiner stated (see page 4 of the Office Action) that Fig. 5 of Padula clearly shows a possible audio scene in a three-dimensional space. However, Fig. 5 of Padula is not a possible audio scene in a three-dimensional space, but a diagrammatic representation of a viewing frustum illustrating an elevation angle. See Padula, col. 8, lines 12-21. The Examiner then stated that any source that is moved would provide an

effect to more than one dimension in a virtual three-dimensional space as simulated in Padula. However, Padula does not disclose a method for generating or consuming a three-dimensional audio scene as required in claim 1. Padula, instead, discloses a method for correcting discrepancies in the apparent "location" of audio sources "in a computer representation of a three-dimensional environment." See Padula, Abstract. As discussed above, the sound source of Padula can be positioned just for compensating for distortions in apparent audio source "location." Moreover, the moving or warping of the sound source does not provide an effect to any one dimension in Padula.

The Examiner then stated that Padula discloses a movable sound source and a moving direction in a virtual three-dimensional space is defined in more than one dimension. However, Padula does not disclose the movable sound source but positioning audio source. The movable sound source is irrelevant to Padula.

Lastly, the Examiner stated that the simulated moving car would have a size and shape with more than one dimension. A visual object would have a defined size and shape. However, the sound source, such as guitar sound, corresponding to the visual object representing guitar with size and shape is still a point sound source.

Thus, in view of at least the foregoing reasons, Padula fails to teach the elements "the sound source characteristics information includes spatiality extension information of the sound source, said spatiality extension information enabling the sound source to include more than one dimension, and includes the size and shape of the sound source expressed in a three-dimensional space," as recited in claim 1. Thus, claim 1 is not anticipated by Padula. Accordingly, reconsideration and withdrawal of the rejection of claim 1 are respectfully requested.

With respect to independent claims 5 and 9, these claims include analogous elements to those in claim 1. Thus, for at least reasons discussed above in connection with claim 1, claims 5 and 9 are not anticipated by Padula. In regard to claims 2-4, 6-8, and 10-15, these claims depend from independent claims 1, 5, and 9, respectively, and incorporate the limitations thereof. Thus, for at least reasons mentioned above in regard to the independent claims, these claims are not anticipated by Padula as well. Accordingly, reconsideration and withdrawal of the rejection of claims 2-15 are respectfully requested.

## CONCLUSION

In view of the foregoing, it is believed that all claims now pending patentably define the subject invention over the prior art of record, and are in condition for allowance and such action is earnestly solicited at the earliest possible date. If the Examiner believes that a telephone conference would be useful in moving the application forward to allowance, the Examiner is encouraged to contact the undersigned at (310) 207 3800.

Respectfully submitted,

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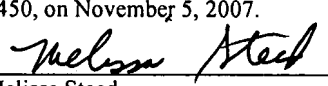
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I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Mail Stop Non-Fee Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on November 5, 2007.

Melissa Stead                November 5, 2007